

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Integrated FHR Technology Development : Tritium Management, Materials Testing, Materials Testing, Salt Chemistry Control, Thermal-Hydraulics and Neutronics with Associated Benchmarking – Massachusetts Institute of Technology

SECTION B. Project Description

Massachusetts Institute of Technology will conduct research is to address major challenges in the development of commercial Fluoride-salt-cooled High-temperature Reactor (FHR) technology: tritium control; fluoride-salt corrosion control and materials selection; thermal-hydraulics and neutronics; and evaluation model benchmarking. This effort will also facilitate work to address other major FHR development challenges, such as high-temperature instrumentation, where this IRP will identify and study the key state parameters that must be monitored by instruments in FHRs to assess safety and reliability, and thus define the key requirements that FHR instrumentation must address.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Waste Generation: The proposed work includes neutron irradiations to be performed at the MIT Research Reactor (MITR) which has an NRC license #R37. The activity to be produced in previous irradiation is estimated to be less than 400 Ci. This is well within their license limit and has been reviewed and approved by both MIT Reactor Safeguards Committee and MIT Radiation Protection Office under Environmental Health and Safety (EHS).

Mixed Waste Generation: The fluoride salt (flibe) to be used for the proposed work contains Beryllium, which is a hazardous material. Hence the irradiated flibe is considered a mixed waste. The EHS deputy director and Reactor Radiation Protection Officer, Dr. Bill McCarthy, has been informed and determined the mixed waste can be handled and disposed of.

Chemical Use Storage and Disposal: This is covered by standard MIT EHS guidelines.

Hazardous Waste Generation: Small amount of flibe will be used for this project. Hazardous waste disposal and handling are covered by standard MIT EHS guidelines.

The action will not create additional environmental impacts above those already occurring at the university.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 08/19/2014